Curriculum Map

Course Title: Science **Grade:** Grade 5

Unit 1: Structure and Properties of Matter		**Engineering Design** **Science and Engineering Practices** ● ***Asking Questions and Defining Problems*** ● ***Planning and Carrying Out Investigations*** ● ***Constructing Explanations and Designing Solutions*** **Disciplinary Core Ideas** ● ***Defining and Delimiting Engineering Problems*** ● ***Developing Possible Solutions*** ● ***Optimizing the Design Solution*** **Crosscutting Concepts** ● ***Influence of Science, Engineering, and Technology on Society and the Natural World***
Unit 2: Matter and Energy in Organisms and Ecosystems		
Unit 3: Earth and Space Systems		

Unit (Name/Number): Unit 3- Earth and Space Systems	**Pacing:**
Essential Question(s): What is the universe, and what is Earth's place in it? (5-ESS1-1), (5-ESS1-2) How and why is Earth constantly changing? (5-ESS2-1), (5-ESS2-2) How do Earth's processes and human activities affect each other? (5-ESS3-1)	

Content/Key Concepts	**Standards**	**Key Vocabulary**	**Learning Activities/Resources**	**Evidence of Learning** (Assessments; Performance Tasks)
The sun is a star that appears larger and brighter than other stars because it is closer.	5-ESS1-1 (NG) 3.3.8.B1 (SAS)	● Relative distance ● Stars ● Sun ●	Support an argument that the apparent brightness of the sun and stars is due to their relative distances from Earth. **RCC: Lesson 1** **Activity: How Big, How Far, How Hot, How Old?**	
Stars range greatly in their distance from Earth.	5-ESS1-1 (NG) 3.3.8.B1 (SAS)	● Apparent brightness ● Earth	Support an argument that the apparent brightness of the sun and stars is due to their relative distances	

		• Relative distance • Stars • Sun	from Earth. **RCC: Lesson 1** **RCC: Lesson 17** **Activity: How Big, How Far, How Hot, How Old?** http://ngss.nsta.org/Resource.aspx?ResourceID=488	
The orbits of Earth around the sun and of the moon around Earth, together with rotation of Earth about an axis between its north and South poles, cause observable patterns (e.g., day and night, length and direction of shadows, different positions of sun, moon, and stars).	5-ESS1-2 (NG) 3.3.5.B1 (SAS)	• Data • Graphical display • Patterns • Representation • Shadows	Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and seasonal appearance of stars in the sky. **RCC: Lesson 8** **RCC: Lesson 12** **Activity: Constellation Location Crash Course Kids** http://ngss.nsta.org/Resource.aspx?ResourceID=960	
All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living organisms.	5-ESS2-1 (NG) 3.3.4.A4 (SAS) 3.3.4.A5 (SAS)	• Atmosphere • Biosphere • Chemical change • Energy flow Geosphere • Hydrosphere • Model • Physical change	Construct and analyze models to describe systems interactions among the geosphere, hydrosphere, atmosphere, and biosphere. **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	
All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. The energy is derived from the sun and the earth's interior. These flows and cycles produce chemical and physical changes in Earth's materials and living	5-ESS2-1 (NG) 3.3.4.A4 (SAS) 3.3.4.A5 (SAS)	• Atmosphere • Biosphere • Chemical change • Energy flow Geosphere • Hydrosphere • Model	Through the creation of a model, explain that the chemical and physical processes that cycle earth materials and form rocks. **RCC: Lesson 4a** **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	

organisms.		• Physical change		
Earth's major systems are the geosphere, hydrosphere, and biosphere, which interact in multiple ways to affect the Earth's surface materials and processes.	5-ESS2-1 (NG) 3.3.4.A4 (SAS) 3.3.4.A5 (SAS)	• Atmosphere • Biosphere • Geosphere • Hydrosphere	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. This could include the influence of atmosphere on landforms and ecosystems though weather and climate, mountain ranges on winds and clouds, etc. **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	
The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate.	5-ESS2-1 (NG) 3.3.4.A4 (SAS) 3.3.4.A5 (SAS)	• Atmosphere • Biosphere • Geosphere • Hydrosphere	Develop a model to describe the ways the geosphere, hydrosphere, and biosphere interact. **RCC: Lesson 13** **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	
Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.	5-ESS2-1 (NG) 3.3.5.A5 (SAS) 3.3.6.A5 (SAS)	• Weather	Utilizing observations and data, explain the patterns of weather in a given location. **RCC: Lesson 21** **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	
Most freshwater is in glaciers or underground with the remainder in streams, lakes, wetlands, and atmosphere.	5-ESS2-2 (NG) 3.3.6.A4 (SAS)	• Distribution	Using real time data, graph amounts of water in various reservoirs to provide evidence about the distribution of water on earth.	
Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation,	5-ESS2-1 (NG) 3.3.5.A4 (SAS) 3.3.6.A4 (SAS)	• Atmosphere • Precipitation • Transpiration	Investigate movement of water in the Earth's systems and research and develop models for the cycling of	

condensation and crystallization, and precipitation as well as downhill flows on land.	3.3.8.A4 (SAS)	• Water cycle • Water system	water. **Activity: NOAA What-a-Cycle** http://ngss.nsta.org/Resource.aspx?ResourceID=13	
Human activities in agriculture, industry, and everyday life have had major effects on land, vegetation, streams, ocean, and air.	5-ESS3-1 (NG) 4.3.10.A (SAS)	• Atmosphere Human impact • Research • Resources	Research and communicate how communities are using science to protect resources and environments.	
			Earth Systems Space Systems: Stars and the Solar System	

5.Earth's Systems

Students who demonstrate understanding can:

5-ESS2-1. Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. [Clarification Statement: Examples could include the influence of the ocean on ecosystems, landform shape, and climate; the influence of the atmosphere on landforms and ecosystems through weather and climate; and the influence of mountain ranges on winds and clouds in the atmosphere. The geosphere, hydrosphere, atmosphere, and biosphere are each a system.] [Assessment Boundary: Assessment is limited to the interactions of two systems at a time.]

5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. [Assessment Boundary: Assessment is limited to oceans, lakes, rivers, glaciers, ground water, and polar ice caps, and does not include the atmosphere.]

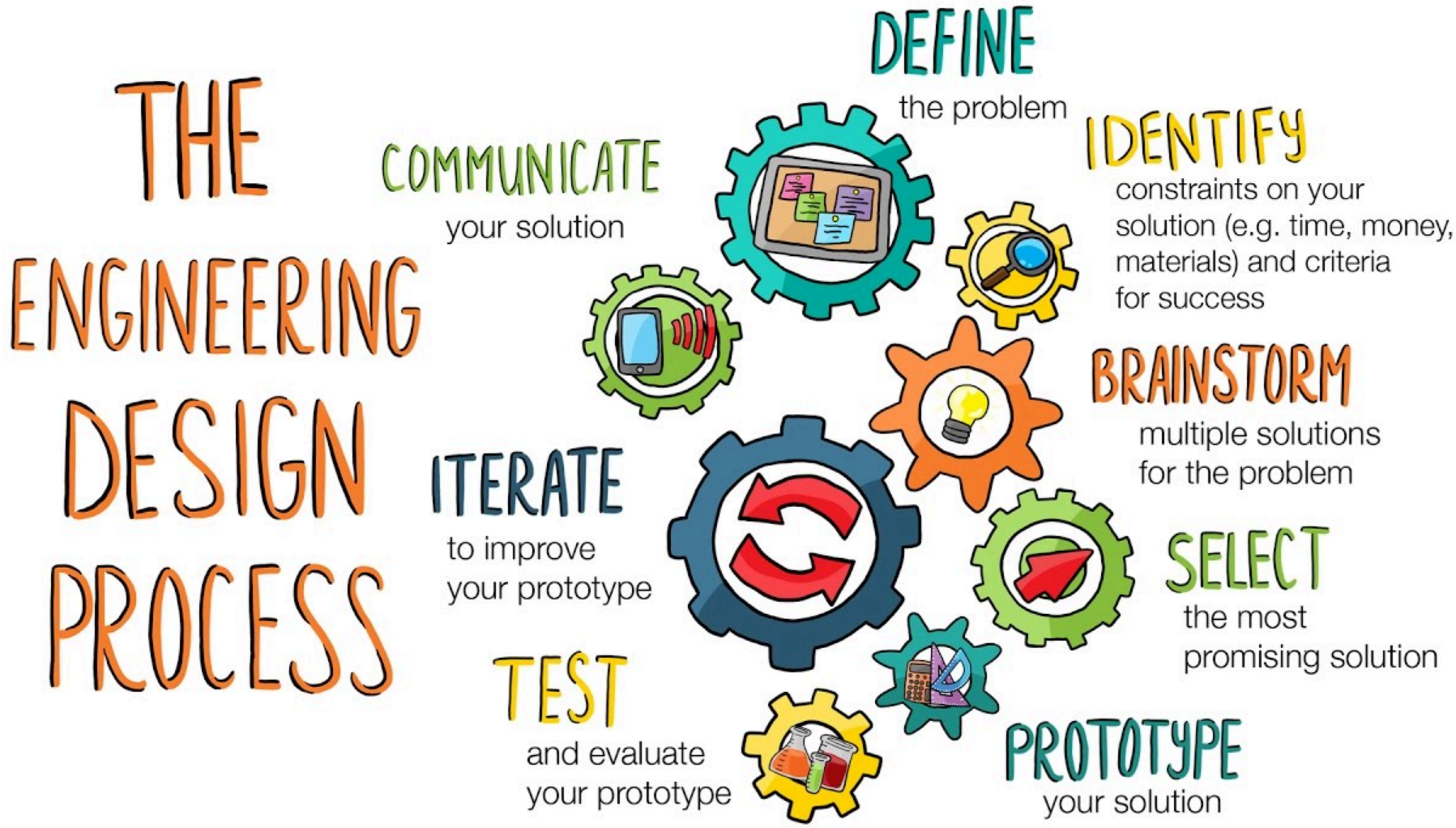
5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

Students who demonstrate understanding can:

5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down. [Clarification Statement: "Down" is a local description of the direction that points toward the center of the spherical Earth.] [*Assessment Boundary: Assessment does not include mathematical representation of gravitational force.*]

5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from the Earth. [*Assessment Boundary: Assessment is limited to relative distances, not sizes, of stars. Assessment does not include other factors that affect apparent brightness (such as stellar masses, age, stage).*]

5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. [Clarification Statement: Examples of patterns could include the position and motion of Earth with respect to the sun and selected stars that are visible only in particular months.] [*Assessment Boundary: Assessment does not include causes of seasons.*]



Video to accompany chart: https://www.youtube.com/watch?v=MAhpfFt_mWM

Resources to use when integrating Engineering Design:

- TeachersPayTeachers: Search "NGSS Engineering Design" and use resources already available
- PBS Teaching NGSS Engineering Design Through Media: https://witf.pbslearningmedia.org/collection/ngss-eng-k-5/#.WzEeradJFPY
- https://www.teacherspayteachers.com/Product/Engineering-Design-Process-Posters-Freebie-888579 (Poster Freebie)